

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES**

In Re Application Of:	§	Attorney Docket No.:
Ching-Yu Chang, et al.	§	2003-1435 / 24061.911
	§	
Serial No.: 10/802,087	§	Customer No. 42717
	§	
Filed: March 16, 2004	§	Group Art Unit: 1714
	§	
For: METHOD AND SYSTEM FOR	§	Examiner: Ryan L. Coleman
IMMERSION LITHOGRAPHY	§	
LENS CLEANING	§	Confirmation No.: 4048

Commissioner for Patents
Mail Stop Appeal Brief - Patents
P.O. Box 1450
Alexandria, VA 22313-1450

REPLY BRIEF

Sir:

A timely Notice of Appeal was previously filed on July 30, 2010 along with a Request for a Pre-Appeal Brief Conference, in order to initiate an appeal from the action of the Primary Examiner in finally rejecting pending claims 2-27 in a Final Office Action mailed on April 7, 2010. A Notice of Panel Decision from Pre-Appeal Brief Review was mailed on August 13, 2010 indicating that the application remains under appeal. An Appeal Brief was filed on September 13, 2010. The Examiner subsequently issued an Examiner's Answer on November 24, 2010.

This Reply Brief is being filed pursuant to the provisions of 37 C.F.R. § 41.41, and is being timely filed within two months of the Examiner's Answer. No fee is required for this Reply Brief. However, if fees are incurred, the Commissioner is hereby authorized to charge the Haynes and Boone LLP, Deposit Account (08-1394) for any related fees. This Reply Brief does not replace the original Appeal Brief, but instead is supplemental to the Appeal Brief.

TABLE OF CONTENTS

Status of Claims	3
Grounds of Rejection to be Reviewed on Appeal.....	4
Argument	6
Conclusion	11

STATUS OF CLAIMS

Claims 2-27 are pending. Claims 2-27 stand finally rejected and are on appeal here. Claims 2-27 are set forth in the Claims Appendix of Applicants' previously-filed Appeal Brief, and have not changed since filing of the Appeal Brief.

GROUND S OF REJECTION TO BE REVIEWED ON APPEAL

The original grounds of rejection to be reviewed on appeal were set forth on pages 11-12 of Applicants' previously-filed Appeal Brief. The current grounds of rejection are set forth below in order to comply with a requirement set forth in MPEP § 1208. In particular, the grounds of rejection to be reviewed on appeal are:

1. Whether claims 2-6 and 8 are unpatentable under 35 U.S.C. § 103(a), over Hazelton et al (U.S. Patent Application Publication No. 2006/0023185 hereinafter referred to as "Hazelton") in view of Zhang et al (U.S. Patent Application Publication No. 2005/0161644 hereinafter referred to as "Zhang") in further view of Amblard et al (U.S. Patent No. 7,056,646 hereinafter referred to as "Amblard").

2. Whether claim 7 is unpatentable under 35 U.S.C. § 103(a), over Hazelton in view of Zhangs and Amblard in further view of Krautschik (U.S. Patent Application Publication No. 2004/0125351 hereinafter referred to as "Krautschik").

3. Whether claims 9-13 are unpatentable under 35 U.S.C. § 103(a), over Hazelton in view of Lyons et al (U.S. Patent No. 7,125,652 hereinafter referred to as "Lyons") in further view of Amblard.

4. Whether claim 14 is unpatentable under 35 U.S.C. § 103(a), over Hazelton in view of Lyons and Amblard, and as evidenced by Zhang.

5. Whether claims 15-19 are unpatentable under 35 U.S.C. § 103(a), over Deng et al (U.S. Patent Application Publication No. 2005/0164502 hereinafter referred to as "Deng") in view of Hazelton.

6. Whether claims 20-21 and 23 are unpatentable under 35 U.S.C. § 103(a), over Hazelton in further view of Amblard.

7. Whether claim 22 is unpatentable under 35 U.S.C. § 103(a), over Hazelton in further view of Amblard in further view of Lyons.

8. Whether claims 24-27 are unpatentable under 35 U.S.C. § 103(a), over Hazelton in further view of Amblard in further view of Langford (U.S. Patent No. 5,443,801 hereinafter referred to as “Langford”).

ARGUMENT

As stated above, this Reply Brief does not replace the original Appeal Brief, but instead is supplemental to the Appeal Brief. As such, most of the arguments with respect to the grounds of rejection to be reviewed on appeal that were previously presented in the Appeal Brief will not be repeated. Rather, the Reply Brief will be used to address the main points of contention between the Appeal Brief and the Examiner's Answer with respect to the independent claims.

Independent Claim 6

The basic position in the Examiner's Answer seems to be that Hazelton discloses an immersion lithography apparatus (para. [0009]) that can supply a cleaning fluid to an optical element in the apparatus (para. [0013]), Zhang discloses an immersion fluid that includes a surfactant, Amblard discloses providing a developer to clean glass, and these references may be combined to render independent claim 6 obvious. The Examiner's Answer states that Hazelton's lack of disclosure of a first fluid containing surfactant is remedied by Zhang, and Hazelton and Zhang's lack of disclosure of a second fluid having a higher surfactant concentration than the first fluid is remedied by Amblard.

The Applicants position is that this interpretation is inconsistent with the disclosure of Amblard when applied to independent claim 6, which recites, in part:

“...performing a light exposing operation on the wafer using an objective lens immersed in a first fluid containing surfactant; and
cleaning the objective lens after the light exposing operation using a second fluid having a higher surfactant concentration than the first fluid.”

As discussed in the Appeal Brief, Amblard repeatedly states “A developer is not contacted with the immersion lithography arrangement after the immersion lithography fluid is removed.” Read in the context of the Amblard disclosure, the Applicants submit that this teaches that after immersion lithography has been performed, the immersion lithography arrangement is not exposed to the developer-containing immersion liquid. Because independent

claim 6 specifically recites that the objective lens is cleaned using the second fluid after the light exposing operation, it is the Applicants position that Amblard teaches away from independent claim 6. In light of this and the Examiner's Answer conclusion that Hazelton and Zhang do not disclose the second fluid, a finding of obviousness is inappropriate.

Independent Claim 9

The basic position in the Examiner's Answer seems to be that Hazelton discloses an immersion lithography apparatus (para. [0009]) that can supply a cleaning fluid to an optical element in the apparatus (para. [0013]), Lyons discloses de-ionized water as an immersion lithography medium, Amblard discloses providing a developer to clean glass, and these references may be combined to render independent claim 9 obvious. The Examiner's Answer states that Hazelton's lack of disclosure of the composition of a first fluid is remedied by Lyons, and Hazelton and Zhang's lack of disclosure of a second fluid including a surfactant-spiked water immersion fluid is remedied by Amblard.

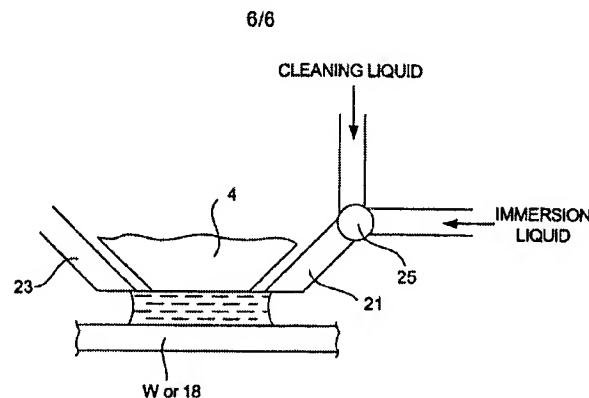
The Applicants position is that this interpretation is inconsistent with the disclosure of Amblard when applied to independent claim 9, which recites, in part:

...performing a light exposing operation on the wafer using an objective lens immersed in a first fluid that does not contain surfactant; and
cleaning the objective lens using a second fluid comprising a surfactant-spiked water immersion fluid.

As discussed above, Amblard repeatedly states "A developer is not contacted with the immersion lithography arrangement after the immersion lithography fluid is removed", and in the context of the Amblard disclosure, this teaches that after immersion lithography has been performed, the immersion lithography arrangement is not exposed to the developer-containing immersion liquid. Because independent claim 9 clearly recites that the objective lens is cleaned using the second fluid, it is the Applicants position that Amblard teaches away from independent claim 9. In light of this and the Examiner's Answer conclusion that Hazelton and Lyons do not disclose the second fluid, a finding of obviousness is inappropriate

Independent Claim 15

The basic position in the Examiner's Answer seems to be that Deng discloses means for positioning a wafer, means for providing the first fluid containing no surfactant, and means for performing a light exposing operation on the wafer using an objective lens immersed in the first fluid, and Hazelton discloses means for providing a surfactant to the first fluid to form a second fluid to reduce the adherence of floating defects to the water or the objective lens. The element of Hazelton, illustrated in Fig. 10 and referred to in the Examiner's Answer as "the pipe on top of a valve #25", is reproduced below:



The Examiner's Answer argues that this element "is fully capable of providing a surfactant to the immersion liquid to reduce an adherence of floating defects to the water or optical element."

The Applicant's respectfully disagree. Hazelton describes Fig. 10 as follows in para. [0044]:

"FIG. 10 shows a different approach to the problem of cleaning the last stage optical element 4 by applying a cleaning liquid on its bottom surface by using the same source nozzles 21 used for supplying the immersion liquid 7. For this purpose, a switch valve 25 is inserted between the supply nozzle 21 and the liquid unit 5 such that the immersion liquid 7 and the cleaning liquid can be supplied selectively through the supply nozzle."

 (emphasis added.)

Thus, the Applicant's submit that the supply nozzle 21 selectively supplies either the cleaning liquid or the immersion liquid to the optical element 4. It is stated in the present disclosure that "...An optional surfactant-spiked immersion lens fluid may subsequently flow into the water immersion lens 406..." (para. [0027]). It is the Applicants position that the "means for providing

a surfactant to the first fluid to form a second fluid to reduce an adherence of floating defects to the wafer or objective lens” provides a surfactant-spiked fluid that may flow into the water immersion lens (i.e., the fluid is spiked with surfactant before it flows into the water immersion lens.) The apparatus of Hazelton, reproduced above, supplies either cleaning fluid or immersion liquid to the optical element, and if those two fluid mix, it is not until they are located in the water immersion lens (the volume between 4 and 18 in Hazelton.) Furthermore, any mixture of the fluids in Hazelton is assumed, and there is no indication that any mixing would occur that would be sufficient to reduce the adherence of floating defects to the water or the objective lens. As such, Hazelton does not disclose means for providing a surfactant to the first fluid to form a second fluid to reduce the adherence of floating defects to the water or the objective lens, and a finding of obviousness is in appropriate.

Independent Claim 20

The basic position in the Examiner’s Answer seems to be that Hazelton discloses an immersion lithography apparatus (para. [0009]) that can supply a cleaning fluid to an optical element in the apparatus (para. [0013]), Amblard discloses providing a developer to clean glass, and these references may be combined to render independent claim 20 obvious. The Examiner’s Answer states that Hazelton’s lack of disclosure of the second fluid including a surfactant is remedied by Amblard.

The Applicants position is that this interpretation is inconsistent with the disclosure of Amblard when applied to independent claim 20, which recites, in part:

...performing a light exposing operation on the wafer using an objective lens immersed in a first fluid; and
cleaning the objective lens using a second fluid containing surfactant.

As discussed above, Amblard repeatedly states “A developer is not contacted with the immersion lithography arrangement after the immersion lithography fluid is removed,” and in the context of the Amblard disclosure, this teaches that after immersion lithography has been

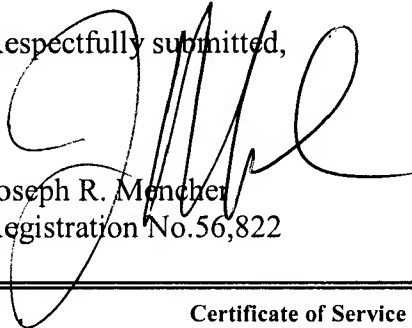
performed, the immersion lithography arrangement is not exposed to the developer-containing immersion liquid. As independent claim 20 clearly recites that the objective lens is cleaned using the second fluid, it is the Applicants position that Amblard teaches away from independent claim 9. In light of this and the Examiner's Answer conclusion that Hazelton does not disclose the second fluid, a finding of obviousness is inappropriate.

CONCLUSION

After careful consideration of the Examiner's Answer, Applicants still believe that the arguments presented in Applicants' Appeal Brief are accurate, and very clearly demonstrate why the rejections of the pending claims are defective. The Applicants also provide the arguments presented above clearly illustrating the rejections are erroneous.

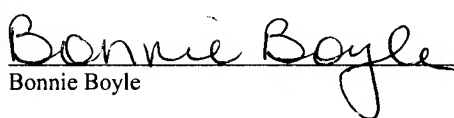
For reasons discussed above, and the reasons discussed in Applicants' Appeal Brief, it is respectfully submitted that the rejections of pending claims 2-27 are erroneous. Accordingly, it is respectfully requested that the Board reverse the rejection of claims 2-27.

Respectfully submitted,


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I hereby certify that this correspondence is being filed with the U.S. Patent and Trademark Office via EFS-Web on <u>Dec. 21, 2010.</u>
 Bonnie Boyle